CLAIMS

1. A method for producing a microchannel chip, comprising the steps of:

a) shielding a surface of a substrate, on which a groove-like channel has been formed, with a mask that exposes the channel,

b) forming a polymer membrane on the exposed surface of the substrate; and

c) laminating a cover material on to the substrate surface on which the channel has been formed.

2. The method of claim 1, comprising the step of forming a polymer membrane on the side of the cover material surface that will be laminated to the substrate.

3. The method for producing the microchannel chip of claim 2, wherein when a polymer membrane is formed on the side of the cover material surface that will be laminated to the substrate, the polymer membrane is formed on an exposed surface of the cover material by shielding the cover material surface with a mask, the exposed area of which is partially or entirely identical in shape to the mask for the substrate.

4. The method of any one of claims 1 to 3, wherein the polymer membrane on the substrate surface is:

(a) a plasma-polymerized membrane formed by plasma polymerizing a plasma-polymerizable monomer on the substrate surface,

(b) a surface-polymerized membrane formed by polymerizing a polymerizable monomer on the substrate surface, or

(c) a polymer-bound membrane formed by binding a polymer compound onto the substrate surface.

5. The method of any one of claims 1 to 4, wherein the polymer membrane on the substrate surface is a plasma-polymerized membrane.

6. The method of any one of claims 2 to 5, wherein the polymer membrane on the cover material surface is:

(a) a plasma-polymerized membrane formed by plasma polymerizing a plasma-polymerizable monomer on the substrate surface,

(b) a surface-polymerized membrane formed by polymerizing a polymerizable monomer on the substrate surface, or

(c) a polymer-bound membrane formed by binding a polymer compound onto the substrate surface.

7. The method of any one of claims 2 to 6, wherein the polymer membrane on the cover material surface is a plasma-polymerized membrane.

8. The method of any one of claims 2 to 7, wherein the polymer membrane formed on

the substrate surface and the polymer membrane formed on the cover material surface are identical polymer membranes.

9. The method of any one of claims 1 to 8, wherein the lamination is performed by pressure bonding or thermocompression bonding.

10. The method of any one of claims 1 to 9, wherein at least either one of the substrate or the cover material is a plastic.

11. The method of any one of claims 1 to 10, wherein the substrate and the cover material are plastics.

12. The method of claim 11, wherein both the substrate and the cover material are a thermoplastic resin, and the laminating process comprises a method in which the substrate and the cover material are attached by thermocompression bonding.

13. The method of claim 12, wherein thermocompression bonding is performed at 200°C or less.

14. The method of claim 10, wherein one of the substrate or the cover material is a silicon resin, and the other is a glass or a plastic, and the laminating process comprises a method in which the substrate and the cover material are attached by pressure bonding.

15. The method of any one of claims 1 to 14, wherein the mask is either a photoresist-mask or a metal mask.

16. A microchannel chip made by laminating a cover material to a channel-side surface of a substrate on which a channel has been formed, wherein a part or the entire surface of the channel on the substrate surface is coated with a polymer membrane.

17. The microchannel chip of claim 16, wherein the substrate-side surface of the cover material is coated with a polymer membrane.

18. The microchannel chip of claim 17, wherein an area on the substrate-side surface of the cover material, which is opposite an area of the substrate on which a polymer membrane is formed, is coated with a polymer membrane partially or entirely identical in shape to that on the part of the substrate on which polymer membrane is formed.

19. A method for separating biomolecules, comprising the steps of:

a) adding a biomolecule to be analyzed to a microchannel chip made by laminating a cover material to a channel-side surface of a substrate on which a channel has been formed, and coating a surface of the channel on the substrate surface with a polymer membrane; and

b) applying a separation pressure to a separating medium.

20. The method of claim 19, wherein the separation pressure is provided by electrophoresis.

21. The method of claim 20, wherein the electrophoresis is capillary electrophoresis.

22. The method of any one of claims 19 to 21, wherein the biomolecule is a protein.

23. An apparatus for electrophoretic analysis comprising the following components:

a) a microchannel chip made by laminating a cover material to a channel-side surface of a substrate on which a channel has been formed, and coating a surface of the channel on the substrate surface with a polymer membrane,

b) a support used to retain the microchannel chip, and

c) electrodes used to apply a voltage to the microchannel chip retained by the support.